Using Matrices HW18 (4.2 and 4.3)

I will be able to multiply two matrices and find their inverse.

Key
Name Per

1.) What has to be true in order to multiply two matrices?

The columns of the first have to equal the rows of the second.

Find the product, if it exists.

2.) $\begin{bmatrix}2\\0\\6\end{bmatrix}\cdot\begin{bmatrix}1 & -3 & 4\end{bmatrix}$ $\begin{bmatrix}2 & -6 & 8\\0 & 0 & 0\\6 & -18 & 24\end{bmatrix}$

3.) $\begin{bmatrix}2 & 5 & 0\end{bmatrix}\cdot\begin{bmatrix}8 & 1\\0 & 4\\2 & 5\end{bmatrix}$ (1×3 · 3×2) $\begin{bmatrix}16 & 22\end{bmatrix}$

Use your calculator to find the following products.

$A=\begin{bmatrix}4 & -2 & 8 & 0\\1 & 3 & -6 & 9\\-5 & 7 & 2 & 1\end{bmatrix}$ $B=\begin{bmatrix}7 & 6\\2 & -3\\-1 & 8\\9 & 5\end{bmatrix}$ $C=\begin{bmatrix}0 & 8\\-2 & 1\end{bmatrix}$

4.) BC $\begin{bmatrix}-12 & 62\\6 & 13\\-16 & 0\\-10 & 77\end{bmatrix}$

5.) BA

not possible
dimensions don't match

6.) A(BC)

$\begin{bmatrix}-188 & 222\\12 & 794\\60 & -142\end{bmatrix}$

7.) Use multiplication to write the following system of equations represented by the matrices.

$\begin{bmatrix}-3 & 4\\-6 & 8\end{bmatrix}\begin{bmatrix}x\\y\end{bmatrix}=\begin{bmatrix}3\\6\end{bmatrix}$ $\begin{bmatrix}-3x+4y\\-6x+8y\end{bmatrix}=\begin{bmatrix}3\\6\end{bmatrix}$ $\begin{cases}-3x+4y=3\\-6x+8y=6\end{cases}$

Determine whether the following matrices are inverses of each other by multiplying them.

8.) $\begin{bmatrix}4 & 0\\0 & 3\end{bmatrix}\cdot\begin{bmatrix}\frac{1}{4} & 0\\0 & \frac{1}{3}\end{bmatrix}$ $\begin{bmatrix}1 & 0\\0 & 1\end{bmatrix}$

Yes, they are inverses because this is the identity.

9.) $\begin{bmatrix}4 & 3\\4 & 2\end{bmatrix}\cdot\begin{bmatrix}2 & -3\\-4 & 6\end{bmatrix}$ $\begin{bmatrix}-4 & 6\\0 & 0\end{bmatrix}$

Not inverses
Not the identity matrix.

Find the **determinant** to tell whether the matrix has an inverse.

10.) $\begin{bmatrix}2 & -5\\-1 & 3\end{bmatrix}$

$2(3)-(-1\cdot-5)$
$6-5=1$
yes

11.) $\begin{bmatrix}2 & 3\\4 & 6\end{bmatrix}$

$2(6)-4(3)$
$12-12$
0 NO

12.) $\begin{bmatrix}2 & 2\\3 & 4\end{bmatrix}$

$2(4)-(3)(2)$
$8-6=2$
yes